

SND-^{ZJ}_{DQJ}系列

电 动 执 行 机 构

**SND-^{ZJ}_{DQJ} RANGE
ELECTRIC ACTUATOR**

**使 用 说 明 书
OPERATING
INSTRUCTION**



常州电站辅机股份有限公司

CHANGZHOU POWER STATION AUXILIARY EQUIPMENT CO., LTD.

特别警示和注意事项

感谢贵单位使用本公司产品，请在使用前务必详细阅读本说明书，否则可能造成控制失效、损坏机构、烧毁电机等严重后果。切记以下注意事项和特别警示（粗体字为特别警示）：

1. 安装前应将电动执行机构存放在清洁干燥的室内，若放在室外，应离地面一定高度，并应有防雨防潮措施。

2. **执行机构上的吊环螺钉只允许起吊本装置，不得连同阀门一起进行起吊。**与阀门连接所用螺钉其强度不得低于 8.8 级。推荐拧紧力矩当 M6 为 $9.3\text{N}\cdot\text{m}$ ，M8 为 $23\text{N}\cdot\text{m}$ ，M10 为 $45\text{N}\cdot\text{m}$ ，M12 为 $78\text{N}\cdot\text{m}$ ，M16 为 $200\text{N}\cdot\text{m}$ ，M20 为 $380\text{N}\cdot\text{m}$ ，M24 为 $650\text{N}\cdot\text{m}$ ，M30 为 $1300\text{N}\cdot\text{m}$ 。

3. **电缆和导线进入后，必须确保电气箱盖和电缆进出口处密封良好，**否则潮气和雨水将进入电气箱内，造成零件锈蚀和电气控制失效。

4. 本系列电动执行机构为全自动结构形式的手、电动切换（无需切换手柄）。手轮旋向与输出轴旋向一致，通常顺时针为关阀，逆时针为开阀。（如果输出轴顺时针转动为开阀称为反向执行机构）。

5. **调试前，首先手动操作阀门，使之处于中间位置，接通电源后短时电动操作，检查输出轴的旋向与阀门的开、关方向是否一致，**若相反则应调整相序（将电机的三相电源的任意两相对调）。

6. 一般不得在阴雨天于户外打开电气箱盖、电机等密封部位，打开电气箱盖时，必须先切断电源。

7. 由于专用电机为短时工作制，调试时连续试车时间不可太长。

8. 拆卸重装（包括电气箱盖打开后重装）时，应注意检查密封件，发现损伤应及时更换，**密封部位必须盖严并螺钉紧固到位。**

9. 箱体内采用专用半流体锂基润滑脂 0 号（无锡炼油厂生产）润滑。每年应检查一次润滑情况，如有异常，应及时更换或补充，如无异常，可继续使用。

10. 对于不经常使用的阀门，应定期检查保养运行操作，建议每月运行一次，时间不超过 15 分钟。

11. 说明书表中的电机电流值仅作参考，实际运行中要比该值大。因为对阀门和阀门电机来讲，是使用电机的过载能力（最大转矩与额定转矩之比大于 5 倍），在阀门的开、关过程中均使用电机的固有特性（过载能力），电流偏大属于正常工作状态。

12. 对于反向执行机构，下列方面与正向机构不一致，具体见有关章节的说明：

①力矩机构中的开向、关向；

②行程机构中调整轴的旋转方向；

③开度机构中指针和电位器 RP1（或阀位变送器中的导电塑料电位器）的调节旋转方向。

尊敬的用户，你在订货时可能对本公司的产品在工作环境、规格、性能参数、连接尺寸、电路等方面提出特殊要求，这样会与本说明书有某些不符。我公司的说明书除加夹专配电气原理图外，其它方面一般不再更改。

CAUTIONS AND NOTICE

Thank you for your choice of our products. Please carefully and entirely read this operating instruction before application or may lead to control failed, mechanism damaged or motor burnt. Following cautions and notice shall be observed (bold fonts are special cautions):

1. The actuators shall be stored in clean and dry room before installation. If stored outdoor, it must be place on a level of certain height off the ground provided with waterproof measures.
2. **Lifting eye bolt on actuator is for the lift of the actuator only, and is not allowed to lift both actuator and valve.** Strength of the screw connecting with the valve is not less than level 8.8. Recommended screw-down torque is 9.3 N·m for M6; 23 N·m for M8; 45 N·m for M10; 78 N·m for M12; 200 N·m for M16; 380 N·m for M20; 650 N·m for M24; and 1300 N·m for M30.
3. **When the cables and wires are leaded in the entrance, good sealing between housing cap and cable entrance must be secured,** or moisture and rainwater may enter the housing and result in parts corrosive and electrical control failing.
4. Actuators of this range are provided with full automatic hand/motor shift (need not shifting lever). Rotation of handwheel is consistent with rotation of output shaft. Generally, clockwise rotation is for valve closing and counterclockwise is for valve opening. (Actuators with clockwise rotation of output shaft for valve opening are called reverse actuators.)
5. **Before commissioning, operate the valve by hand to medium position, and then turn on the power supply for short time operation to check if the rotation of output shaft is consistent with the opening direction and closing direction.** If not, phase sequence shall be adjusted (Exchange any two phase of the three).
6. Generally, terminal compartment and sealing part of motor shall not be disassembled on rainy days. Before the opening of the cover of terminal compartment, must turn off the power supply at first.
7. During commissioning, continuous trial time shall not be too long, for the duty of the motor is for short time running.
8. Reassembling after disassembling (including terminal compartment), do inspect the sealing parts carefully. Damaged or worn out parts shall be replaced in time. **Sealing parts must be tightened and screws must be secured.**
9. The housing is filled with No. 0 semifluid lithium soap base grease (produced by Wuxi Oil Refinery). Lubrication shall be checked once a year. If abnormal lubrication occurs, the grease shall be replaced or supplemented. If no abnormal occurs, it can go on operating.
10. For valves not operated frequently, regular check and maintenance shall be carried out. Operating no more than 15 minutes once a month is recommended.
11. Motor current values in the table of this instruction are for reference only. Values in actual operation are more than these values. When driving the valve, valve motor makes use of the inherent operating characteristic of overloading (the ratio between maximum torque and rated torque is 5 times) during the course of valve opening or closing. So it is a normal operating condition that the current tends to be more than rated current.
12. For reverse actuators following aspects are different from positive actuators. Details refer to relevant sections of this instruction:
 - ① Opening direction and closing direction of torque level mechanism;
 - ② Rotation direction of adjusting axis of travel limit mechanism;
 - ③ Rotation direction of adjusting for pointer and potentiometer RP1 of position indicating mechanism (or conductive plastic potentiometer of transmitter).

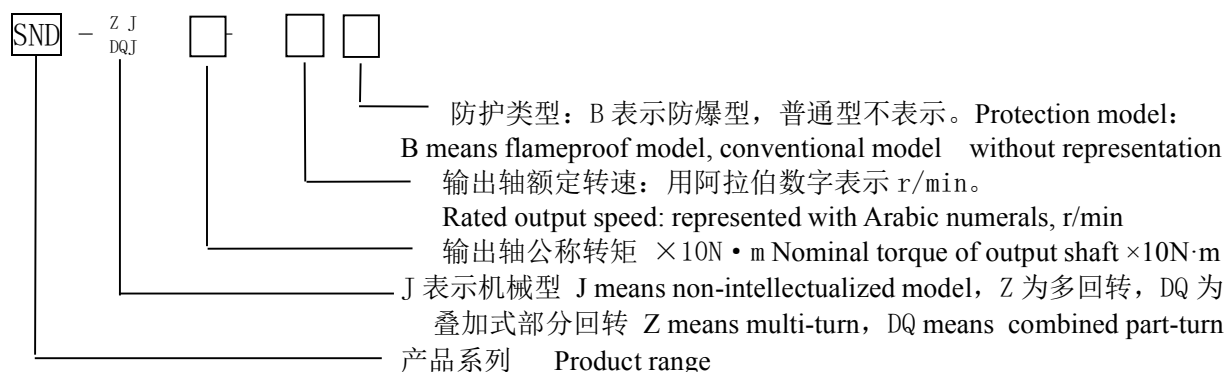
Dear users, when ordering you may put forward your special requirements of service environment, specifications, performance parameters, connection dimensions and electrical circuit different from this operating instruction. With the exception of special electrical schematic diagram added to this operating instruction, other contents in this instruction remain unchanged.

一 概 述 General Description

SND 机械型电动执行机构是智能型非侵入式电动执行机构的派生产品，它吸收智能型产品设计的先进理念，具有体积小、重量轻、转矩范围广、防护等级高等特点。该产品是对开环控制系统中最终控制元件（如阀门）的运行进行控制的一种装置，即满足阀门开关要求的产品。按工作环境分可分为普通产品和防爆产品两大系列。性能指标分别达到 GB/T24923-2010《普通型阀门电动装置技术条件》和 GB/T24922-2010《隔爆型阀门电动装置技术条件》。

SND electric actuators are derived from non-intrusive intellectualized electric actuators. With the application of the new concept of advanced intellectualized electric actuators, these actuators are small in size, light in weight and with extended range of output torque and high degree of protection. These products are used to control the operation of end control element in open loop system. They can meet the requirements of valve opening and closing. They are divided into two models: flameproof model and conventional model according to working environments. And both performances are conformed to Std. GB/T24923-2010 Technical Specifications for Conventional Electric Valve Actuators and Std. GB/T24922-2010 Technical Specifications for Flameproof Electric Valve Actuators.

二 型号表示方法 Type and Representation



为了更明确反映产品的功能，采用功能代号，常位于型号之后。功能代号的各项含义如下（自左向右）：第一项为接盘形式，F 为方接盘，圆盘省略；第二项为行程控制器位置数目，4 表示四位置，两位置省略；第三项 S 表示带 4~20mA 电流阀位变送器。

For clear description of product function, function code is adopted after type. Meanings of various function codes are defined as following (from left to right):

First item is mode of attachment: F represents square attachment and round attachment without any letter representation; second item is the number of control position of travel limit: 4 represents 4 positions and two positions without number representation; third item S represents 4 ~ 20mA transmitter of valve position signal.

三 工作环境 Working Environments

1. 电机电压：常规为 380V，50Hz，（特殊订货可 380V~660V，50Hz，60Hz，以合同为准）
控制电压：常规为 220V，50Hz，（特殊订货可 60Hz，以合同为准）
2. 工作环境：
 - 2.1 环境温度：-20~60℃，（特殊订货可 -40~70℃）
 - 2.2 环境相对湿度：≤90%（25℃时）
 - 2.3 工作环境：普通型：不含有腐蚀性、易燃、易爆的介质；
防爆型：防爆等级为 Exd II BT4Gb、Exd II CT4Gb、ExtDA21IP65T130℃。
 - 2.4 防护等级 IP68（水下 7 米深 72 小时）
3. 电机为短时工作制，时间定额为 15 分钟，电机绝缘等级 F 级

- 3.1 Motor voltage: 380 V, 50 Hz normally (380V~660V, 50Hz, 60Hz for special order)
Control voltage: 220 V, 50 Hz normally (60 Hz for special order)
- 3.2 Working environment:
- 3.2.1 Environmental temperature: -20~60℃, (-40~70℃ for special order)
- 3.2.2 Relative humidity: ≤90% (at 25℃)
- 3.2.3 Working environments: no corrosive, flammable, or explosive gases for conventional model;
For flameproof model, provided with explosion-proof classes Exd II BT4Gb、Exd II CT4Gb and ExtDA21IP65T130℃。
- 3.2.4 Enclosure protection: IP 68 (7 meter depth under water for 72 hours)
- 3.3 Duty of motor: short time operating, rated working time: 15 min, insulation of motor: Class F

四 结 构 Structure

1. SND-ZJ 多回转型:
 - ①输出转矩 $50\text{N} \cdot \text{m} \sim 2500\text{N} \cdot \text{m}$, 为单级 SND 执行机构, 见图 1
 - ②输出转矩 $3500\text{N} \cdot \text{m} \sim 10000\text{N} \cdot \text{m}$, 为 SND 叠加直齿轮减速器而成。
2. SND-DQJ 叠加式部分回转型:
 - ①输出转矩 $4000\text{N} \cdot \text{m} \sim 63000\text{N} \cdot \text{m}$, 为 SND 叠加蜗轮减速器而成。
 - ②输出转矩 $80000\text{N} \cdot \text{m} \sim 165000\text{N} \cdot \text{m}$, 为 SND 先叠行星齿轮减速器再叠蜗轮减速器而成。
 - ③输出转矩小于 $4000\text{N} \cdot \text{m}$, 为特殊订货。

电动时, 传动路线如下: 专用电机---蜗杆轴---蜗轮---离合器---输出轴; 需要手动时, 压下切换手柄, 使其处于手动位置, 这时松开手柄, 手柄将恢复到初始位置。旋转手轮直到与离合器啮合即可手动操作, 传动路线如下: 手轮---离合器---输出轴。返回电动时, 切换机构将自动脱离, 回到电动操作状态。SND-ZJ₆₀^{4.5}及以上通常具有手动减速机构, 速比见技术参数表。(减速机构图 1 中未画出)

1. SND-ZJ (multi-turn)
 - 1.1 It is single stage SND for output torque $50\text{N} \cdot \text{m} \sim 2500\text{N} \cdot \text{m}$, see Fig. 1;
 - 1.2 It is a combination of the first stage (SND) and the second stage (a spur gear reducer) for output torque $3500\text{N} \cdot \text{m} \sim 10000\text{N} \cdot \text{m}$;
2. SND-DQJ (combination part-turn)
 - 2.1 It is a combination of the first stage (SND) and the second stage (a worm gear reducer) for output torque $4000\text{N} \cdot \text{m} \sim 63000\text{N} \cdot \text{m}$;
 - 2.2 It is a combination of the first stage (SND) and the second stage (a planetary gear reducer) and the third stage (a worm gear reducer) for output torque $4000\text{N} \cdot \text{m} \sim 63000\text{N} \cdot \text{m}$;
 - 2.3 It need special order for less than $4000\text{N} \cdot \text{m}$.

When electrically operating, the drive course is as following: motor---worm shaft---worm gear---clutch---output shaft. When manual operating, press down the shift handle to make it on manual operation position. Undo the handle, it will turn back to original position. Rotate the handwheel till it gets mesh with the shift. Then the valve can be operated by handwheel and the drive course is as following: handwheel---clutch---output shaft. When electric energized, the shift mechanism will declutch and turn back to electric operation mode automatically.

It equip manul reducer for SND-ZJ₆₀^{4.5} and more than SND-ZJ₆₀^{4.5}. The hand ratio see the table of Main Technical Parameters. (The manul reducer not be drawn in Fig. 1)

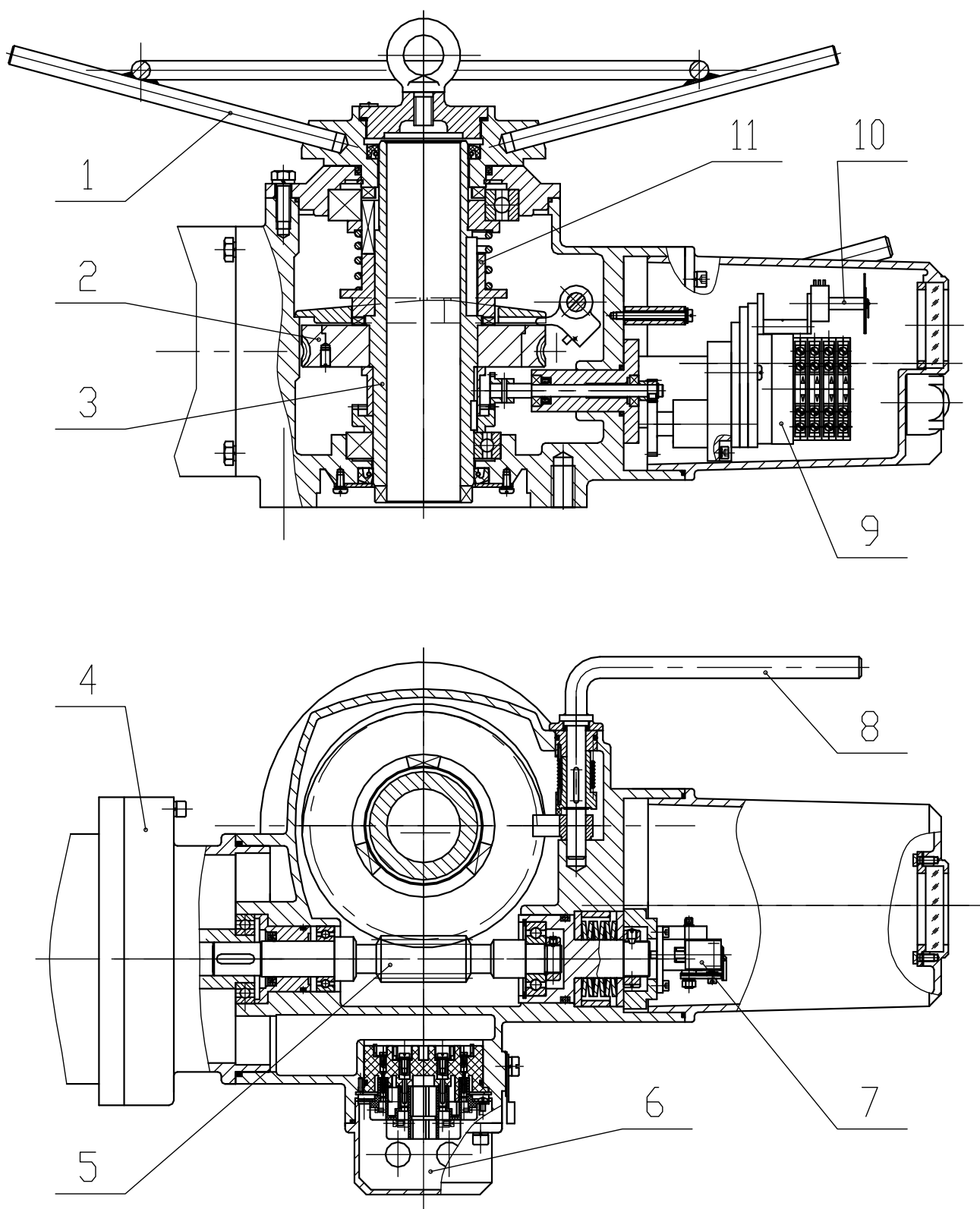


图 1 SND-ZJ 结构图

Fig. 1 Structure of SND-ZJ

- | | | | |
|-----------------------------|-------------------|--------------------------|----------------------|
| 1. 手轮 handwheel | 2. 蜗轮 worm gear | 3. 输出轴 output shaft | 4. 电机 motor |
| 5. 蜗杆轴 worm shaft | 6. 接线盒 wiring box | 7. 力矩机构 torque mechanism | 9. 行程机构 travel limit |
| 10. 开度机构 position indicator | | 11. 离合器 clutch | |

1. SND-ZJ(B) 规格和主要技术参数 Specifications and Main Technical Parameters

Type	Motor			Output Speed (r/min) Data in brackets are for SND-Z180 and SND-Z250											Thrust (KN)	Max. dia. of stem (mm)	Max. rotation (rev)	Hand ratio	Weight (kg)
	Type	Power (kW)	Current (A)	6	9	12 (14)	18	24 (27)	36	48 (54)	72	96	144	192					
				Nominal torque (N · m)															
SND—ZJ ₁₅ ⁵ SND—ZJ _{15B} ⁵	YDF ₃ 800-6 I	0.18	1.1			100 150									40	30 (32)	≤1200	1	40~50
	YDF ₃ 631-4 I	0.09	0.63				50												
	YDF ₃ 632-4 I	0.12	0.74				80	50	50										
	YDF ₃ 633-4 I	0.18	1.0				100	80	80	50									
	YDF ₃ 800-4 I	0.25	1.4				150	100	100	80									
	YDF ₃ 801-4 I	0.37	1.8					150	150	100									
	YDF ₃ 802-4 I	0.55	2.4							150									
	YDF ₃ 800-2 I	0.37	1.38								80	50							
YDF ₃ 801-2 I	0.55	1.86								120	100	80	50						
SND—ZJ ₄₀ ²⁰ SND—ZJ _{40B} ²⁰	YDF ₃ 801-6 II	0.25	1.42			250									100	44 (40)	≤1200	1	58~75
	YDF ₃ 802-6 II	0.37	1.96			350													
	YDF ₃ 801-4 II	0.37	1.8				300	250											
	YDF ₃ 802-4 II	0.55	2.4				400	350	300	250									
	YDF ₃ 901-4 II	0.75	2.8					400	400	300									
	YDF ₃ 802-2 II	0.75	2.4								150	120	100	80					
	YDF ₃ 901-2 II	1.1	3.3								250	200	150	120					
SND—ZJ ₆₀ ⁴⁵ SND—ZJ _{60B} ⁴⁵	YDF ₃ 100M-6 III	0.75	3.11			600									150	50	≤1200	2.829	100~130
	YDF ₃ 100M1-4 III	0.75	2.8				450												
	YDF ₃ 100M2-4 III	1.1	4				600	450	450										
	YDF ₃ 100L1-4 III	1.5	5					600	600	450									
	YDF ₃ 100L2-4 III	2.2	7							600									
	YDF ₃ 100L-2 III	2.2	6.3								450	300	300						
	YDF ₃ 112M1-2 III	3	7.8								600	450	450	300					
	YDF ₃ 112M2-2 III	4	9.7									600	600	450					
YDF ₃ 112L-2 III	5.5	13.3											600						
SND—ZJ ₁₂₀ ⁹⁰ SND—ZJ _{120B} ⁹⁰	YDF ₃ 100L1-6 III	1.1	4.2			900									200	60	≤1200	4.3	120~170
	YDF ₃ 100L2-6 III	1.5	5.7			1200													
	YDF ₃ 100L1-4 III	1.5	5				900												
	YDF ₃ 100L2-4 III	2.2	6.3				1200	900	900										
	YDF ₃ 112L1-4 III	3	9					1200	1200	900									
	YDF ₃ 112L2-4 III	4	11.9							1200									
	YDF ₃ 112M2-2 III	4	9.7								900								
	YDF ₃ 112L-2 III	5.5	13.3								1200	900	900						
	YDF ₃ 132L1-2 III	7.5	17.1									1200	1200	900					
YDF ₃ 132L2-2 III	10	22.8											1200						
SND—ZJ ₂₅₀ ¹⁸⁰ SND—ZJ _{250B} ¹⁸⁰	YDF ₃ 100L1-4 III	1.5	5	1800, 2500	1800										325	70	≤449	11.48	180~260
	YDF ₃ 100L2-4 III	2.2	6.3		2500	1800, 2500	1800												
	YDF ₃ 112L1-4 III	3	9				2500												
	YDF ₃ 112M1-2 III	3	7.8					1800											
	YDF ₃ 112M2-2 III	4	9.7					2500	1800										
	YDF ₃ 112L-2 III	5.5	13.3						2500	1800									
	YDF ₃ 132L1-2 III	7.5	17.1							2500	1800								
YDF ₃ 132L2-2 III	10	22.8								2500									
SND—ZJ ₅₀₀ ³⁵⁰ SND—ZJ _{500B} ³⁵⁰	YDF ₃ 100L2-4 III	2.2	6.3	3500	3500										700	100	≤300	17.2	300~400
	YDF ₃ 112L1-4 III	3	9	5000	5000	3500													
	YDF ₃ 112L2-4 III	4	11.9			5000													
	YDF ₃ 112M2-2 III	4	9.7				3500												
	YDF ₃ 112L-2 III	5.5	13.3				5000	3500											
	YDF ₃ 132L1-2 III	7.5	17.1					5000	3500										
	YDF ₃ 132L2-2 III	10	22.8						5000	3500									
SND—ZJ ₁₀₀₀ ⁸⁰⁰ SND—ZJ _{1000B} ⁸⁰⁰	YDF ₃ 112L2-4 III	4	11.9	8000 10000											1100	120	≤150	34.4	350~500
	YDF ₃ 112L-2 III	5.5	13.3		8000 10000														
	YDF ₃ 132L1-2 III	7.5	17.1			8000 10000													
	YDF ₃ 132L2-2 III	10	22.8				8000 10000												

注：① 3500N · m 以上为叠加结构 ② 输出速度栏中括号内数据专用于 SND-Z₂₅₀¹⁸⁰ ③ 电机的起动电流和最大电流约为额定值的 7 倍，运行过程中电流偏大是正常现象。④ 最大阀杆直径栏中括号内数据用于中速缓冲型推力盘和高速缓冲型推力盘。

2. SND-DQJ (B)

型号 type	转矩 torque N · m	转速 speed r/min (转 90° 时间)	手动 速比 hand ratio	第一级型号及其 电机功率 type and power of the first stage	第二级速比 (型号) ratio and type of the second stage	第三级速比 (型号) ratio and type of the third stage
SND-DQJ200	2000	0.486 (30.8S)	37	SND-ZJ20-18, 0.37kW	37 (DJ1A)	-----
SND-DQJ400	4000	0.316 (47.5S)	57	SND-ZJ30-18, 0.37kW	57 (DJ2A)	-----
SND-DQJ600	6000	0.316 (47.5S)	57	SND-ZJ40-18, 0.55kW	57 (DJ2A)	-----
SND-DQJ800	8000	0.327 (45.8S)	156	SND-ZJ45-18, 0.75kW	55 (DJ3A)	-----
SND-DQJ1000	10000	0.327 (45.8S)	156	SND-ZJ60-18, 1.1kW	55 (DJ3A)	-----
SND-DQJ1600	16000	0.31 (48.3S)	249	SND-ZJ90-18, 1.5kW	58 (DJ4A)	-----
SND-DQJ2000	20000	0.31 (48.3S)	249	SND-ZJ120-18, 2.2kW	58 (DJ4A)	-----
SND-DQJ3200	32000	0.333 (45S)	620	SND-ZJ250-18, 3.0kW	54 (DJ5A)	-----
SND-DQJ4000	40000	0.333 (45S)	620	SND-ZJ250-18, 3.0kW	54 (DJ5A)	-----
SND-DQJ6300	63000	0.26 (57.5S)	792	SND-ZJ250-18, 3.0kW	69 (DJ6A)	
SND-DQJ8000	80000	0.26 (57.5S)	1187	SND-ZJ90-72, 4.0kW	4 (XJ4A)	69 (DJ6A)
SND-DQJ12500	125000	0.168 (89S)	2452	SND-ZJ180-36, 4.0kW	2.67 (XJ4B)	80 (DJ7A)
SND-DQJ16500	165000	0.168 (89S)	2452	SND-ZJ250-36, 5.5kW	2.67 (XJ4B)	80 (DJ7A)
SND-DQJ25000	250000	0.104 (145S)	3990	SND-ZJ250-36, 5.5kW	4.138 (XJ5)	84 (DJ8A)

如果是隔爆型，其型号的末尾需加 B，如 SND-DQJ800B

Add letter "B" for flame-proof, example SND-DQJ800B.

六、外形和连接尺寸 Overall Size and Connection Dimension

1. SND-ZJ

1.1 SND-ZJ5~ZJ250 外形尺寸 overall size of SND-ZJ5~ZJ250

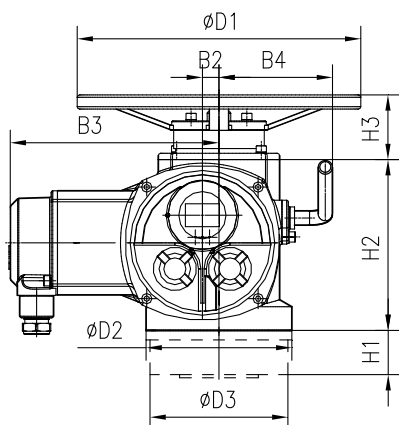


图 2. SND-ZJ5~ZJ60 外形尺寸

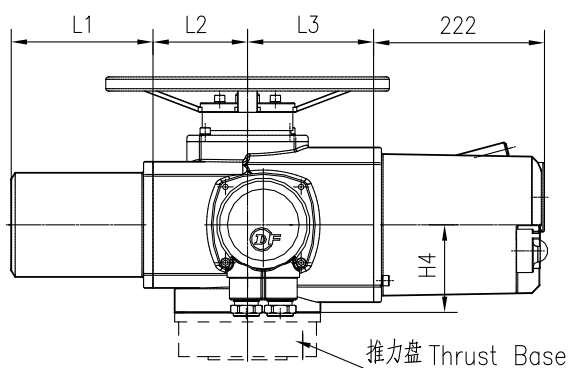


Fig.2 Overall size of SND-ZJ5~ZJ60

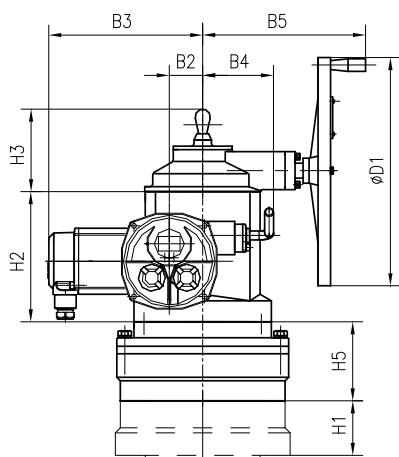


图 3. SND-ZJ90~250 外形尺寸

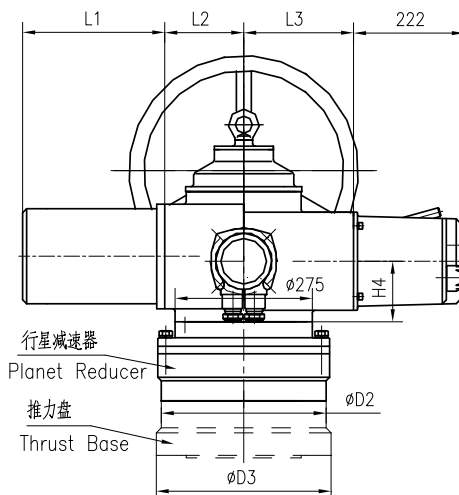


Fig.3 Overall size of SND90~250

SND-ZJ5~ZJ250 外形尺寸表 Overall size table of SND-ZJ5~ZJ250

型号 type	L1	L2	L3	H1	H2	H3	H4	B2	B3	B4	D1	D2	D3
SND-ZJ ₁₅ ⁵	145, 180	110	145	46 (69, 89)	214	62	108	21	284	144	260	140	126
SND-ZJ ₄₀ ^{2 0}	180, 190	120	160	56 (89, 118)	217	82	111	21	308	144	360	185	175
SND-ZJ ₆₀ ^{4 5}	200~285	148	239	80 (117, 140)	245	97	118	55	319	142	420	225	210

型号 type	L1	L2	L3	H1	H2	H3	H4	H5	B2	B3	B4	B5	D1	D2	D3
SND-ZJ ₁₂₀ ^{9 0}	255~397	158	220	110 (151, 190)	260	165	121		67	352	142	326	460	275	300
SND-ZJ ₂₅₀ ^{18 0}	255~397	158	263	125 (191)	260	165	121	158	67	352	142	326	460	330	350

说明: 1. SND-ZJ₁₂₀^{9 0}无行星减速器。

Note: 1. SND-ZJ₁₂₀^{9 0} without planet reducer.

2. 图中 H1 为推力盘的高度尺寸, 对于转矩型无此接盘。表格中 H1 括号内的尺寸分别为中速缓冲推力盘和高速缓冲推力盘的高度尺寸

2. H1 is the height of thrust base, torque mode without this base.

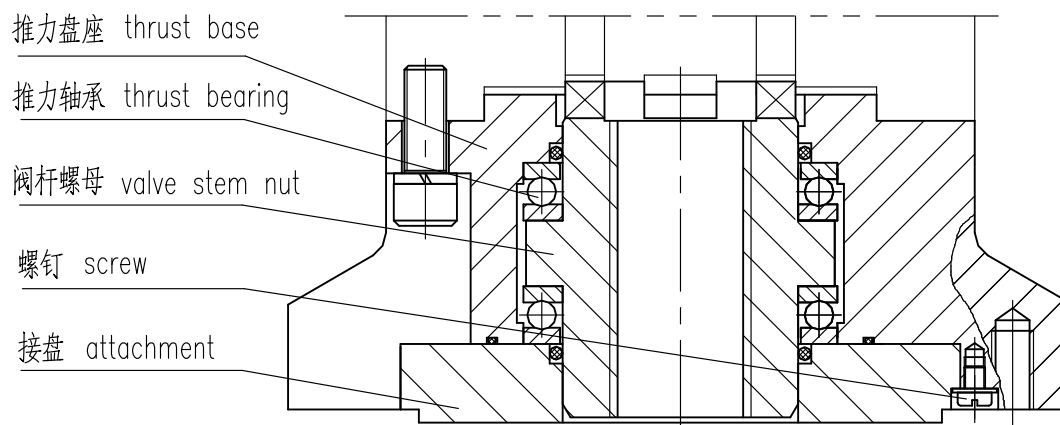


图 4. 推力盘结构 Fig.4 structure of thrust base

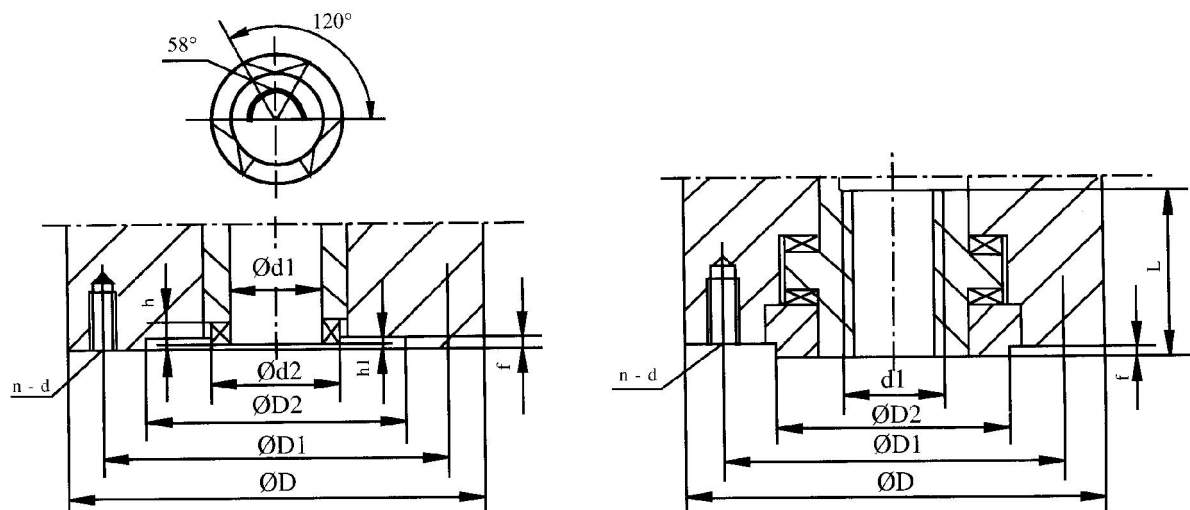
对于推力型电动执行机构, 是在转矩型的基础上附加图 4 所示的推力盘。与阀门组装前配套单位或用户需根据阀杆的参数加工阀杆螺母, 拧下螺钉, 卸下接盘即可取出阀杆螺母, 重装时要注意不能漏装和损伤 O 形密封圈。

推力型电动执行机构所能承受的最大推力和允许通过的最大阀杆直径均不能超过技术参数表中的规定, 否则可能造成零件损坏。

The actuator of thrust mode is a combination of a thrust attachment and an actuator of torque mode as shown in Fig 4. Before assembling with valve, users or suppliers in package should machine the valve stem nut according to the parameters of the stem. Loosen the crew, remove the attachment and take out the nut. When reassembling, pay attention to sealing and prevent the missing or damage of O-ring.

Maximum thrust force the actuators of thrust mode could stand and maximum stem diameter shall not be above relevant specifications, or may result in parts damage.

1.3 SND-ZJ5~ZJ1000 连接尺寸 connection dimensions of SND-ZJ5~ZJ1000



转矩型 torque mode (JB2920)

推力型 thrust mode (ISO5210)

图 6. SND-ZJ5~ZJ1000 连接尺寸

Fig. 6 connection dimensions of SND-ZJ5~ZJ1000

SND-DJ5~DJ1000 连接尺寸表

connection dimensions of SND-ZJ5~ZJ1000

型号 type	转矩型 torque mode (JB2920-81)										推力型 thrust mode (ISO5210)							
	Frame size	d1	d2	D2 (H9)	n-d	D1	D	h1	h	f	Flange size	D	D1	D2 (f8)	d1	n-d	L	f
SND-ZJ ₁₅ ⁵	2	33	44	90	4-M10	120	145	2	8	4	F10	126	102	70	T30 (32)	4-M10	40(62, 75)	3
	2I	26	39	75	4-M8	95	145	2	6	4								
SND-ZJ ₄₀ ^{2 0}	3	42	58	125	4-M12	160	185	2	10	4	F14	175	140	100	T44 (40)	4-M16	50(82, 101)	4
	3I	32	45	90	4-M10	120	185	2	8	4								
SND-ZJ ₆₀ ^{4 5}	4	52	72	150	4-M16	195	225	2	12	5	F16	210	165	130	T50	4-M20	80(108, 133)	5
SND-ZJ ₁₂₀ ⁹⁰	5	62	82	180	4-M20	235	275	2	14	5	F25	300	254	200	T60	8-M16	114(140, 168)	5
	5I	52	72	150	4-M16	195	230	2	12	5								
SND-ZJ ₂₅₀ ^{1 8 0}	7	73	98	220	4-M24	285	330	3	16	6	F30	350	298	230	T70	8-M20	130 (179)	5
SND-ZJ ₅₀₀ ^{3 5 0}	8	80	118	280	8-M20	340	380	3	20	6	F35	415	356	260	T100	8-M30	170	5
SND-ZJ ₁₀₀₀ ⁸⁰⁰	9	85	128	300	8-M24	380	510	3	25	8	F40	510	406	300	T120	8-M36	230	8
	10	105	158	360	8-M30	450	510	3	30	8								

说明:

1. 如果是隔爆型, 其型号的末尾需加 B, 如 SND-ZJ90B;
2. 机座号中的 “I” 表示电站型 (JB2920);
3. 安装螺纹孔的位置与电机轴线成错开对称分布;
4. 安装螺纹孔的有效深度 $\geq$ 螺纹公称直径的 1.8 倍;
5. 表格中推力型 d1 括号内的尺寸为中速缓冲推力盘和高速缓冲推力盘允许穿过的最大阀杆直径, L 为对应的梯形螺纹长度。

Explanation:

- 1) For flameproof model, letter B is added after the type representation, e.g. SND-ZJ90B;
- 2) I in frame size represents power station mode;
- 3) Screwed holes for mounting are distributed symmetrical and staggered to motor shaft axis;
- 4) Valid depth of screwed holes for mounting ≥ 1.8 times of nominal diameter of screw;
- 5) Table D1 thrust type brackets for medium size buffer cache the thrust plate and the thrust plate are allowed through the maximum stem diameter ,L length corresponding to the trapezoidal thread.

2. SND-DQJ

2.1 SND-DQJ200 外形和连接尺寸

Overall size and connection dimensions of SND-DQJ200

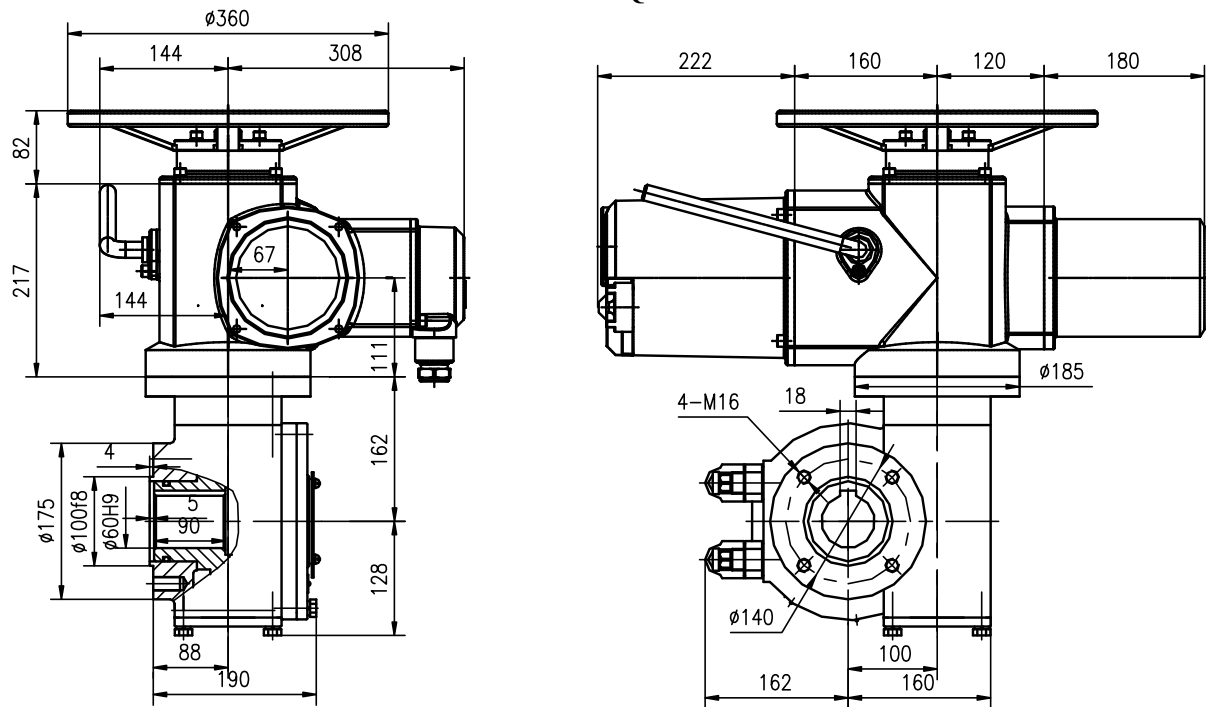


Fig.7 Overall size and connection dimensions of SND-DQJ200

2.2 SND-DQJ400~DQJ600 外形和连接尺寸

Overall size and connection dimensions of SND-DQJ400~DQJ600

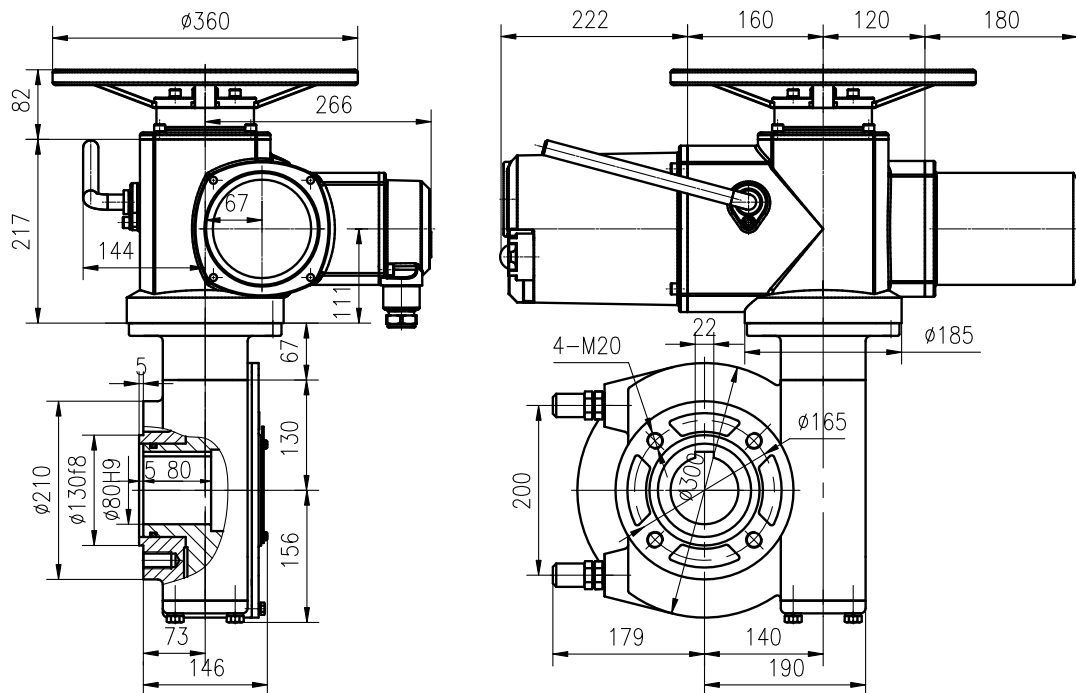


Fig.8 Overall size and connection dimensions of SND-DQJ400~DQJ600

2.3 SND-DQJ800~DQJ1000 外形和连接尺寸

Overall size and connection dimensions of SND-DQJ800~DQJ1000

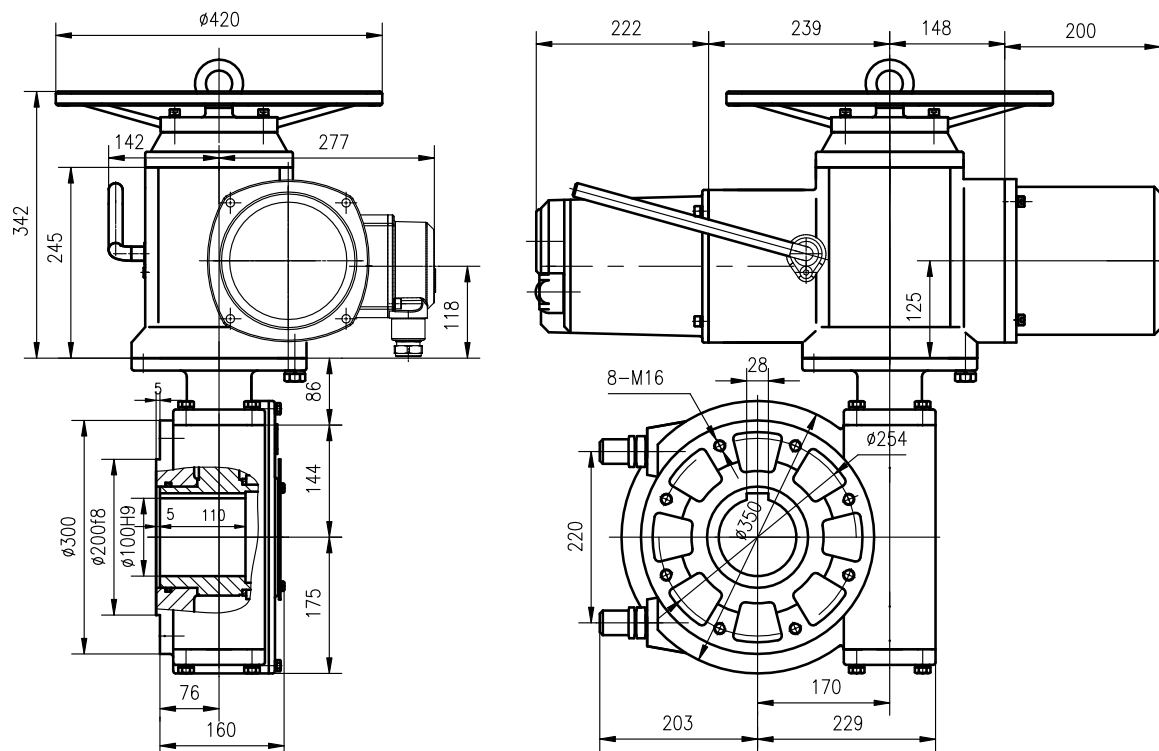


Fig.9 Overall size and connection dimensions of SND-DQJ800~DQJ1000

2.4 SND-DQJ1600~DQJ2000 外形和连接尺寸

Overall size and connection dimensions of SND-DQJ1600~DQJ2000

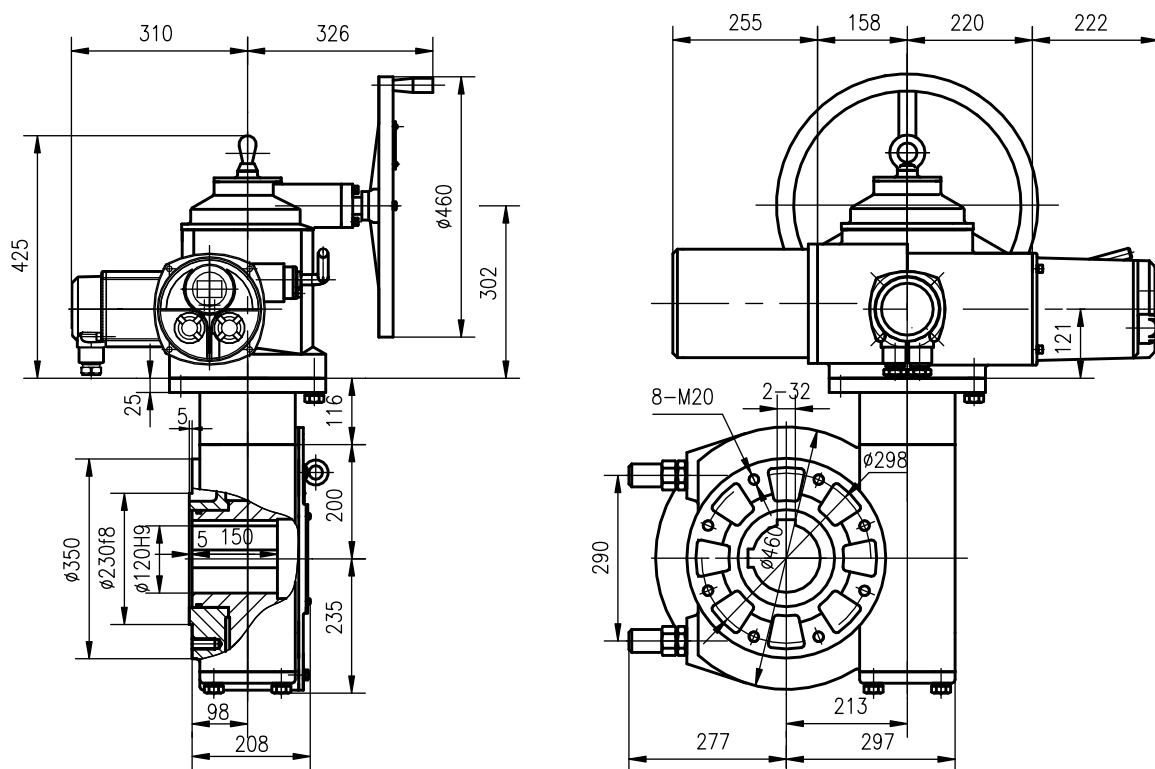


Fig.10 Overall size and connection dimensions of SND-DQJ1600~DQJ2000

2.5 SND-DQJ₄₀₀₀³²⁰⁰外形和连接尺寸

Overall size and connection dimensions of SND-DQJ₄₀₀₀³²⁰⁰

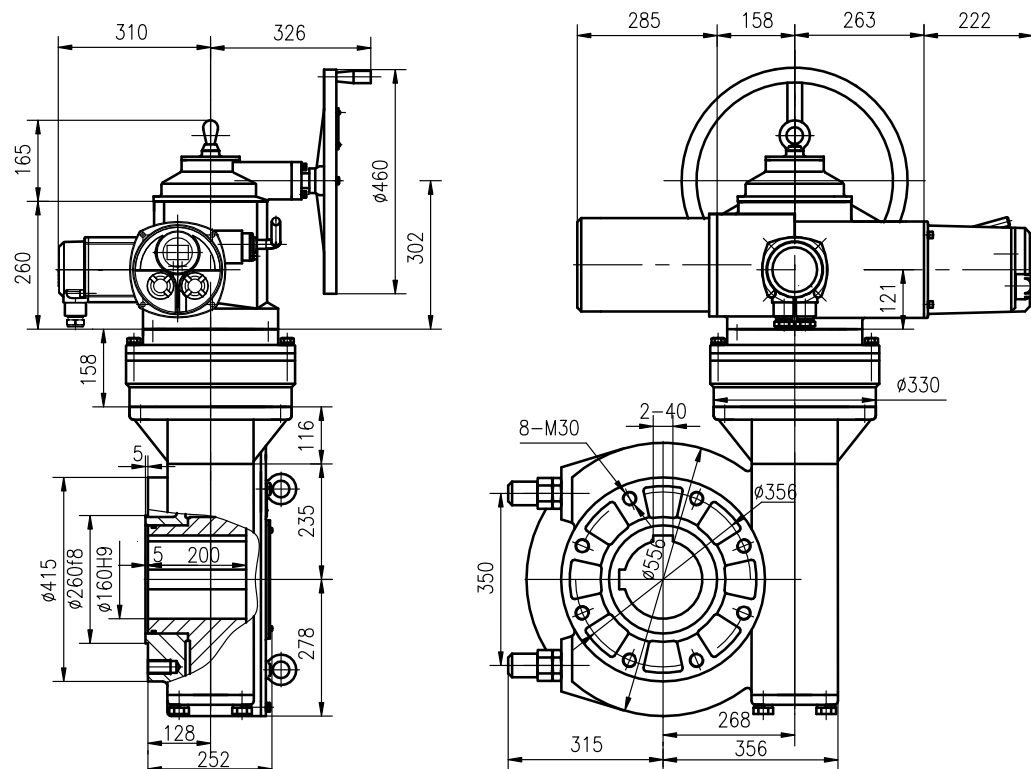


Fig.11 Overall size and connection dimensions of SND-DQJ₄₀₀₀³²⁰⁰

2.6 SND-DQJ6300~DQJ25000 外形和连接尺寸

Overall size and connection dimensions of SND-DQJ6300~DQJ25000

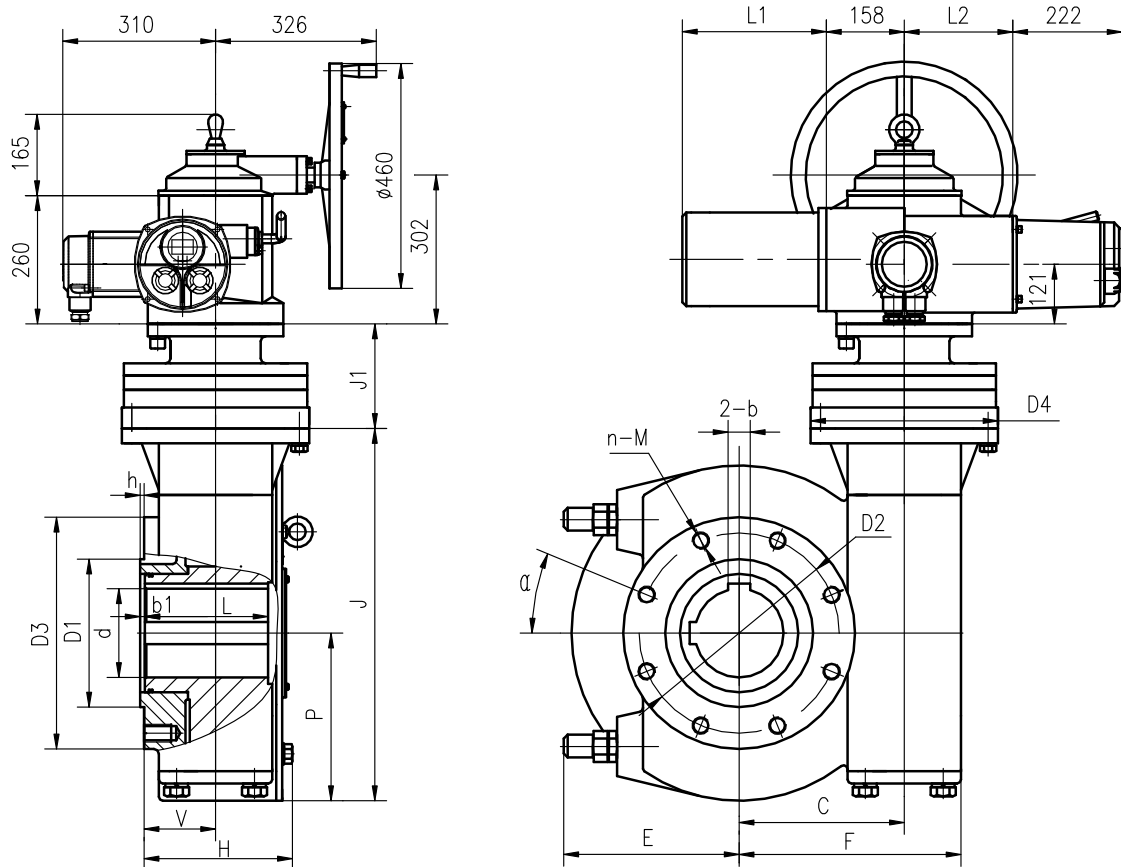


Fig.12 Overall size and connection dimensions of SND-DQJ6300~DQJ25000

型号	C	D4	E	F	H	J	J1	L1	L2	P	V
SND-DQJ6300	335	380	356	450	301	745	158	285	263	340	145
SND-DQJ8000	335	380	356	450	301	745	212	240	220	340	145
SND-DQJ12500	465	380	480	605	400	946	404	240	263	426	153
SND-DQJ16500	465	380	480	605	400	946	404	285	263	426	153
SND-DQJ25000	582	510	547	752	431	1245	466	285	263	595	201

型号	d (H9)	D1 (f8)	D2	D3	h	b1	L	b	n-M	α
SND-DQJ6300	180	300	406	470	8	9	250	45	8-M36	22.5°
SND-DQJ8000	180	300	406	470	8	9	250	45	8-M36	22.5°
SND-DQJ12500	220	370	483	560	8	8	285	50	12-M36	15°
SND-DQJ16500	220	370	483	560	8	8	285	50	12-M36	15°
SND-DQJ25000	280	470	603	686	8	8	310	63	20-M36	9°

七、电气原理及接线 Electrical Schematic Diagram and Wiring Diagram

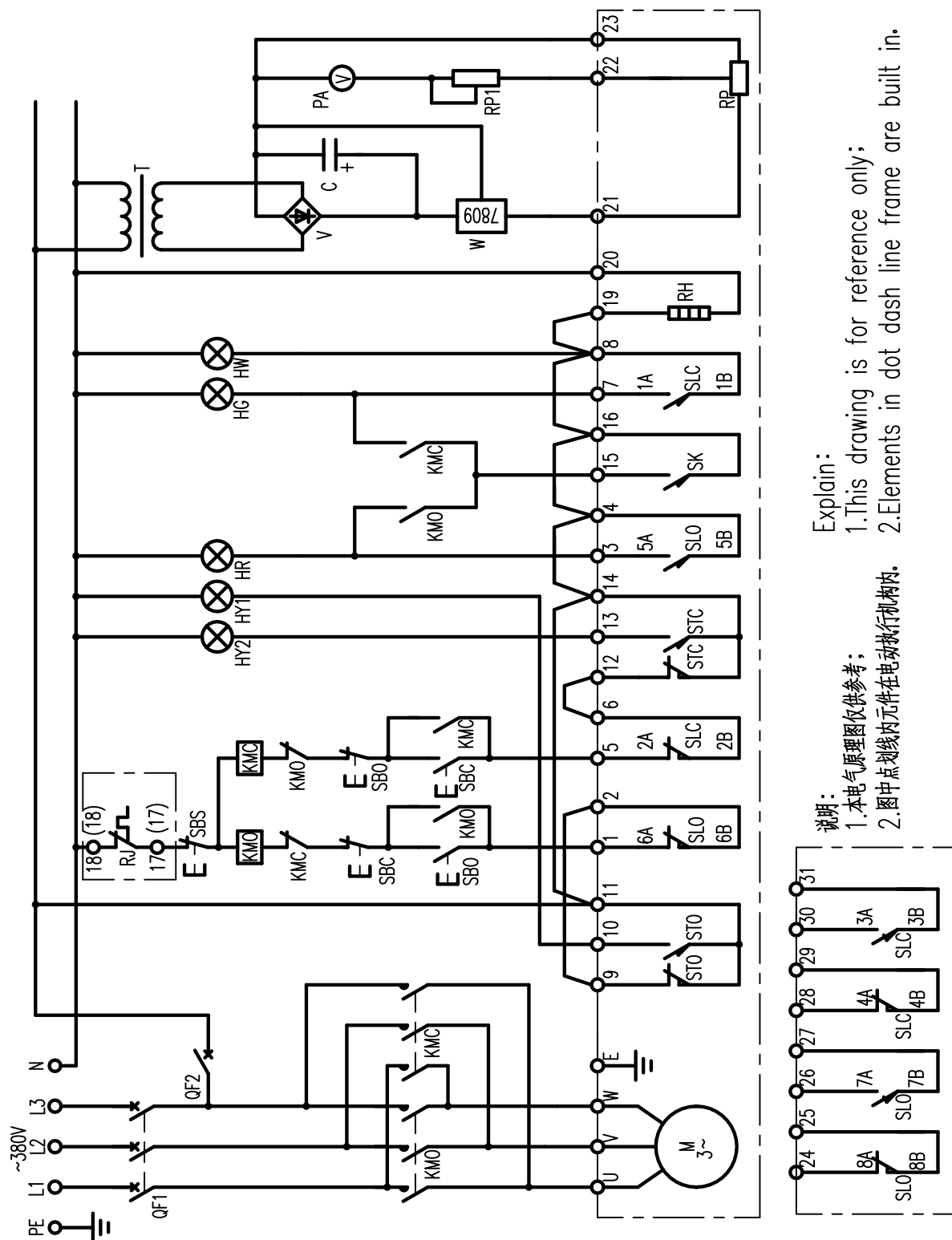
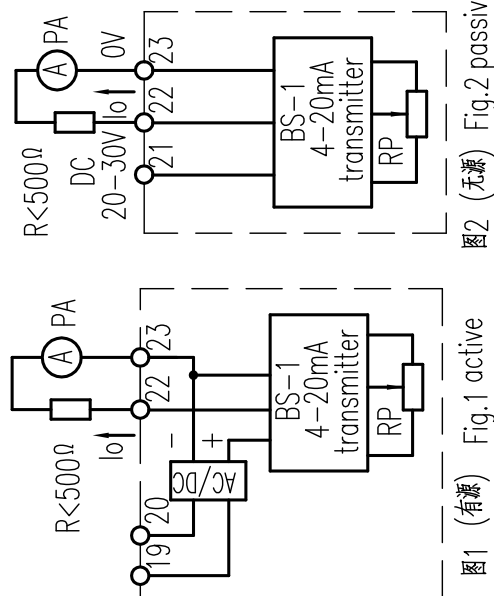
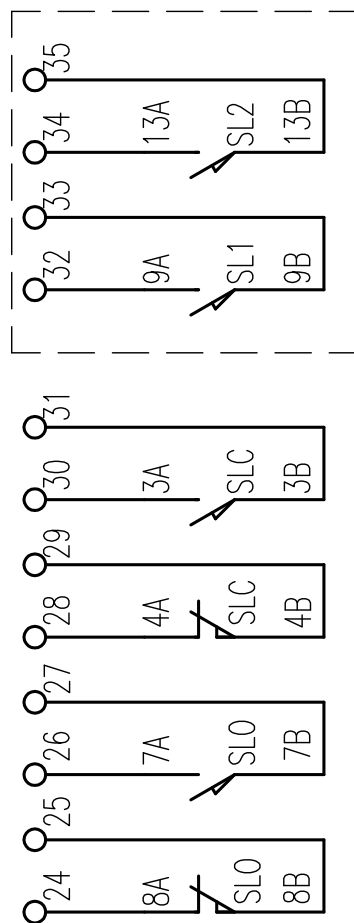
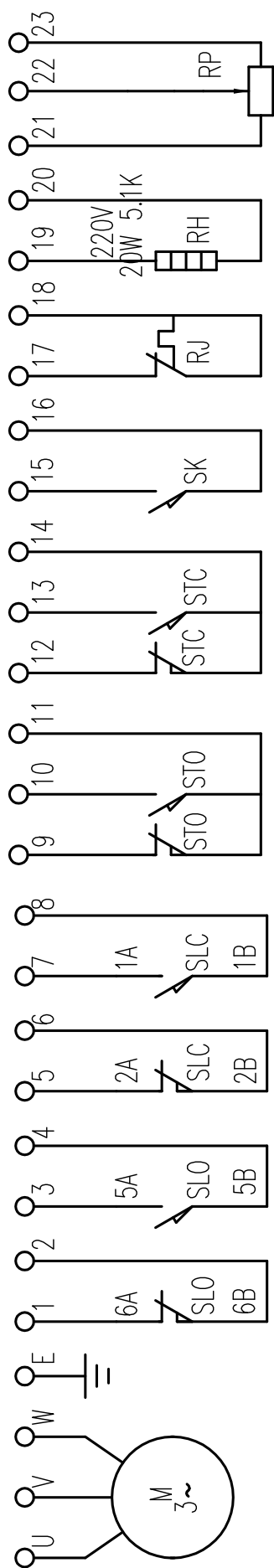


图 13. 电气原理图 Fig.13 Electrical schematic diagram



说明：1.虚线框内为特规供货；Elements in dash line frame are for special order.

2.如需带变送器，图中电位器RP不接，按图1或图2接线。
If transmitter of valve position signal is needed, potentiometer RP in the figure is not connected, but is connected according to Fig.1 or Fig.2.

1	QF1	空气开关	breaker	10	W	三端稳压器	manostat	7809
2	KMO、KMC	交流接触器	A.C.contacts	11	PA	电压表	volt meter	85C1 5V
3	QF2	空气开关	breaker	12	RP1	电位器	galvanometer	6.8K
4	HW、HY1、HY2	电源、故障指示灯	indicating lamp	13	SLO、SLC	开、关	行程开关	limit switch
5	HR、HG	开、关指示灯	indicating lamp	14	STO、STC	开、关	向力矩开关	torque switch
6	SBO、SBC、SBS	按钮	buttons	15	SK	闪光开关	flashing switch	
7	T	变压器	transformer	220/12V 10W	RH	加热电阻	heater	RX20-20W 5.1K
8	V	整流桥	rectifier diode	W04M	RP	电位器	potentiometer	100Ω
9	C	电容	capacitor	100μF 25V	RJ	电机热保护开关	thermostat	

图 14. 电气接线图 Fig.14 Internal wiring diagram

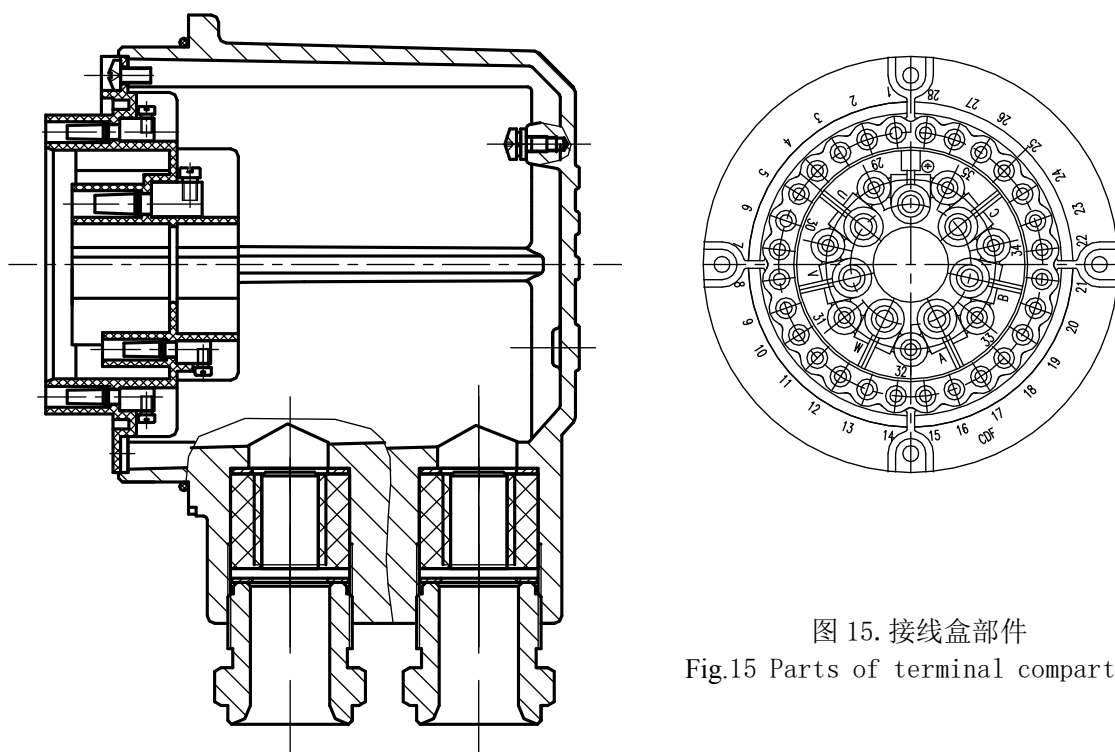


图 15. 接线盒部件
Fig.15 Parts of terminal compartment

1. 电机功率及电流请参见规格和主要技术参数表（注意电机的起动电流约为额定值的 7 倍）。行程控制器上的开关是我公司自行研制的，每对触点独立隔开，触点容量为 AC 220V 10A。力矩机构中的开关采用外购的微动开关，触点容量为 AC 220V 5A，电气箱内部控制回路的连线采用的是耐温好的丁腈塑线。
2. 接线端子为接插件式，见图 5，隔爆型和非隔爆型通用。U、V、W、A、B、C 供动力电缆用，插针直径 3.5；1~35 供控制线用，插针直径 2.5；接地线必须正确可靠。
3. 图 5 中的电缆引入装置有三个，通常动力电缆和控制电缆分开（对于小功率的也可以合并）。引入装置中的橡胶套有两种孔径尺寸，应根据电缆的外径决定，通常为 15 或 19。一定要确保橡胶套和电缆之间的可靠密封。压紧螺母的螺纹为 M33X1.5。
若对控制电路有特殊要求，可以由用户提出要求由我公司设计再用用户确认，也可以用户提供现成的电路图（比如设计院的图纸）由我公司确认。

7.1 Power and current of motor refers to the table of Specifications and Main Technical Parameters (note: starting current of motor is about 7 times of rated value). Switches on travel limit mechanism are developed and made by ourselves and capacity of contact is A.C. 220 V 10 A. Microswitches on torque level mechanism are purchased and capacity of contact is A.C. 220 V 5 A. Connecting wires of control loop in terminal compartment are heat proof butyronitrile wires.

7.2 Terminals are socket connector, as shown in Figure 5, and universal for flameproof model and non-flameproof model. U, V, W, A, B, C are for power cables and diameter of plug pin is 3.5 mm. Terminals 1~35 are for control wires and diameter of plug pin is 2.5 mm. Earthing wire must be right and secured.

7.3 There are three entrances of cable. Power cable and control cable are generally separated (As miniwatt, they may be combined in one entrance). There are two bore sizes (15 or 19) of rubber ring in entrance for cables of different external diameter. The sealing between rubber ring and cable must be reliable. Screw of clamp nut is M33X1.5.

If users have special requirement for control circuit, we can design special control circuit according to user's requirement and then submit it to user for validation. We can also accept user's ready-made control circuit validated by us.

八、 调 整 Adjustment

电动执行机构与阀门组装后, 应对力矩控制器、行程控制器、开度机构进行调整, 方可使用, 调整前务必使阀门处于中间位置。

After the assembling of electric actuator and valve, before the assembly is put into operation, torque level, travel limit and valve position indicator must be adjusted. When adjusting, the valve must be in medium position.

1. 力矩机构的调整

力矩控制器的结构见图 16。力矩控制器在出厂前已根据订货要求整定好并填在产品证明书上(如用户未指定, 通常对于多回转执行机构来说, 开向整定在公称值上, 关向为公称值的 0.7 倍; 对于部分回转执行机构来说, 开、关向都整定在公称值上), 一般不允许再调整, 若一定要调的话, 必须十分谨慎, 方法如下: (以关方向增大力矩值为例) 顺时针转动关向调整轴 9 (若转不动或很费劲, 需略拧松螺母 8, 待调好后再拧紧), 这时关向凸轮 4 相应顺时针转过一角度使得关向凸轮与关向微动开关 5 的压动滚轮之间的距离增大, 力矩也随之增大, 但决不能盲目调大, 否则关严后可能打不开, 如果超出力矩机构的控制范围将烧毁电机。对于开方向, 因为已经整定在公称值上, 所以不允许调大只允许调小。

8.1 Adjustment of torque level

The structure of torque level refers to Figure 16. Before delivery, the torque level has been set according to ordering requirement and the value is filled in the quality certificate. (If users do not specify the torque level, generally, torque level in opening direction is the nominal torque and as in closing direction is 0.7 time of nominal torque for multi-turn valves; and for part-turn valves, torque level values in both directions are set to nominal torque.) It is not allowed to reset commonly. If it is necessary to reset, it must be carried out carefully as following: (taking the increment of torque level in closing direction as example) turn clockwise the adjusting axis for closing (if it cannot be turned or turning is very tough, loosen Nut 8 slightly, and tighten it again after adjustment), and Cam 4 for closing will rotate clockwise a certain degree to increase the distance between Cam 4 and pressing roller of Microswitch 5 for closing. Thus the torque level increases. But the torque level must not be increased blindly or the valve will not be able to open after seating. If the torque level goes beyond control range, the motor will be burnt. For the adjustment of the torque level in opening direction, it has been set to nominal value and so only the decrement of torque level is allowed.FF

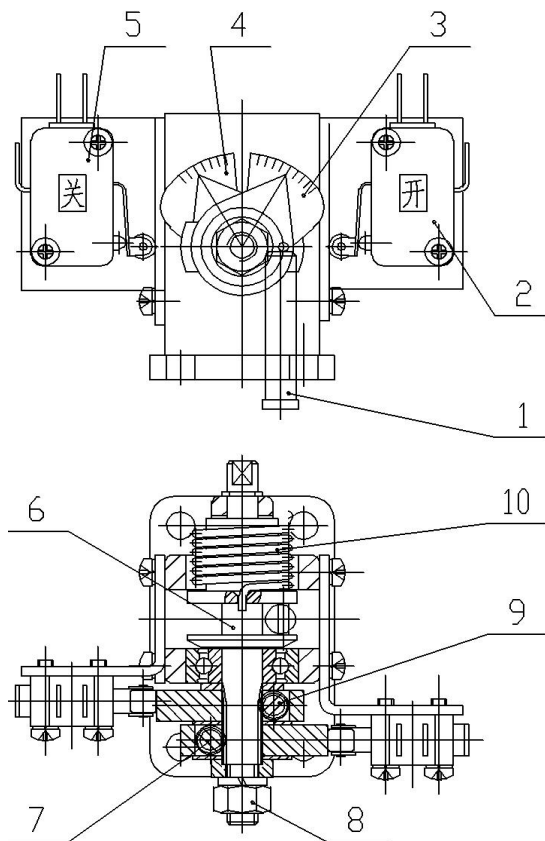


图 16. 力矩控制机构 Fig16.torque level mechanism

- 11. 推杆
- 12. 开向微动开关
- 13. 开向凸轮
- 14. 关向凸轮
- 15. 关向微动开关
- 16. 转轴
- 17. 开向调整轴
- 18. 螺母
- 19. 关向调整轴
- 20. 扭簧

- 1. Push rod
- 2. Opening microswitch
- 3. Opening cam
- 4. Closing cam
- 5. Closing microswitch
- 6. Turning axis
- 7. Adjusting axis for opening
- 8. Nut
- 9. Adjusting axis for closing
- 10. Torsion spring

2. 行程控制器的调整 行程控制器的结构见图 17.

(1) 阀门“全关”位置的调整

- ① 将手动切换手柄向下压，用手动将阀门“全关”，再从这个位置稍退回一点。
- ② 用螺丝刀压下顶轴，并转 90° 可卡住为止。
- ③ 按关向箭头旋转“关向”调整轴，直到转动柱上的小凸台方向与两旁箭头方向基本一致为止。
- ④ 旋回顶轴，使之复位。

(2) 阀门“全开”位置的调整

- ① 在阀门“全关”位置调好的基础上，手动或电动将阀门开到“全开”位置之前停下（建议开到全行程的 95% 左右）。
- ② 用螺丝刀压下顶轴，并转 90° 可卡住为止。
- ③ 按开向箭头旋转“开向”调整轴，直到转动柱上的小凸台方向与两旁箭头方向基本一致为止。
- ④ 旋回顶轴，使之复位。

(3) 中间位置的调整

中 1 和中 2 两个中间位置，用户可以根据需要用于开向或关向的中间位置，或用于增加开、关向的触点数。这时调整轴的旋转方向视中 1、中 2 是用于开向还是关向而定，若用于开向则与开向调整轴的旋向一致，若用于关向则与关向调整轴的旋向一致。

行程控制器全部调好后，需电动试运转，控制器控制的整个行程应符合要求，否则需要重新进一步调整。

在行程控制器的调整过程中，如果出现调过头或者还没有开始调转动柱已经处于动作状态（即转动柱上小凸台方向与两旁箭头基本一致），这时需反方向旋转调整轴，直到恢复动作前状态，再按箭头方向重新调。

8.2 Adjustment of travel limit

The structure of travel limit mechanism refers to Figure 17.

8.2.1 Adjustment of “full closing”

8.2.1.1 Press down the Hand/auto shift lever and manually operate the valve to “full closing” and then retreat a little.

8.2.1.2 Press the top axis with a screwdriver and rotate 90° till clamped.

8.2.1.3 Turn the adjusting axis for closing along with the arrow indicating closing till the shoulder on the roller top is consistent with arrows on both sides.

8.2.1.4 Turn back top axis to original position.

8.2.2 Adjustment of “full open”

8.2.2.1 After the adjustment of full closing is finished, open the valve by hand operating or electrical operating and stop before “full open” (opening of 95% of whole travel is recommended).

8.2.2.2 Press the top axis with a screwdriver and rotate 90° till clamped.

8.2.2.3 Turn the adjusting axis for opening along with the arrow indicating opening till the shoulder on the roller top is consistent with arrows on both sides.

8.2.2.4 Turn back top axis to original position.

8.2.3 Adjustment of medium positions

Mid 1 and Mid 2 may be used as medium positioning in opening direction or closing direction according to users' requirements. They may also be used to increase number of contact in opening direction or closing direction. For their adjustment, the turning direction of adjusting axis is decided in accordance with the operating direction Mid 1 or Mid 2 is used for. If it is used for opening direction, turning direction will be consistent with the direction of adjusting axis for opening. If for closing direction, turning direction will be consistent with the direction of adjusting axis for closing. When all adjustments of travel limit mechanism is completed. It is necessary to operate the valve electrically for a trial to find out if the all control of travel limit meets the requirement. If not, further adjustment is needed.

During the adjustment of travel limit mechanism, if overstriding travel or roller is in acting condition before adjustment (i.e. shoulder on the roller top is consistent basically with arrows on both sides), turn the adjusting axis in negative direction till pre-acting condition is returned and then reset according to the arrow direction.

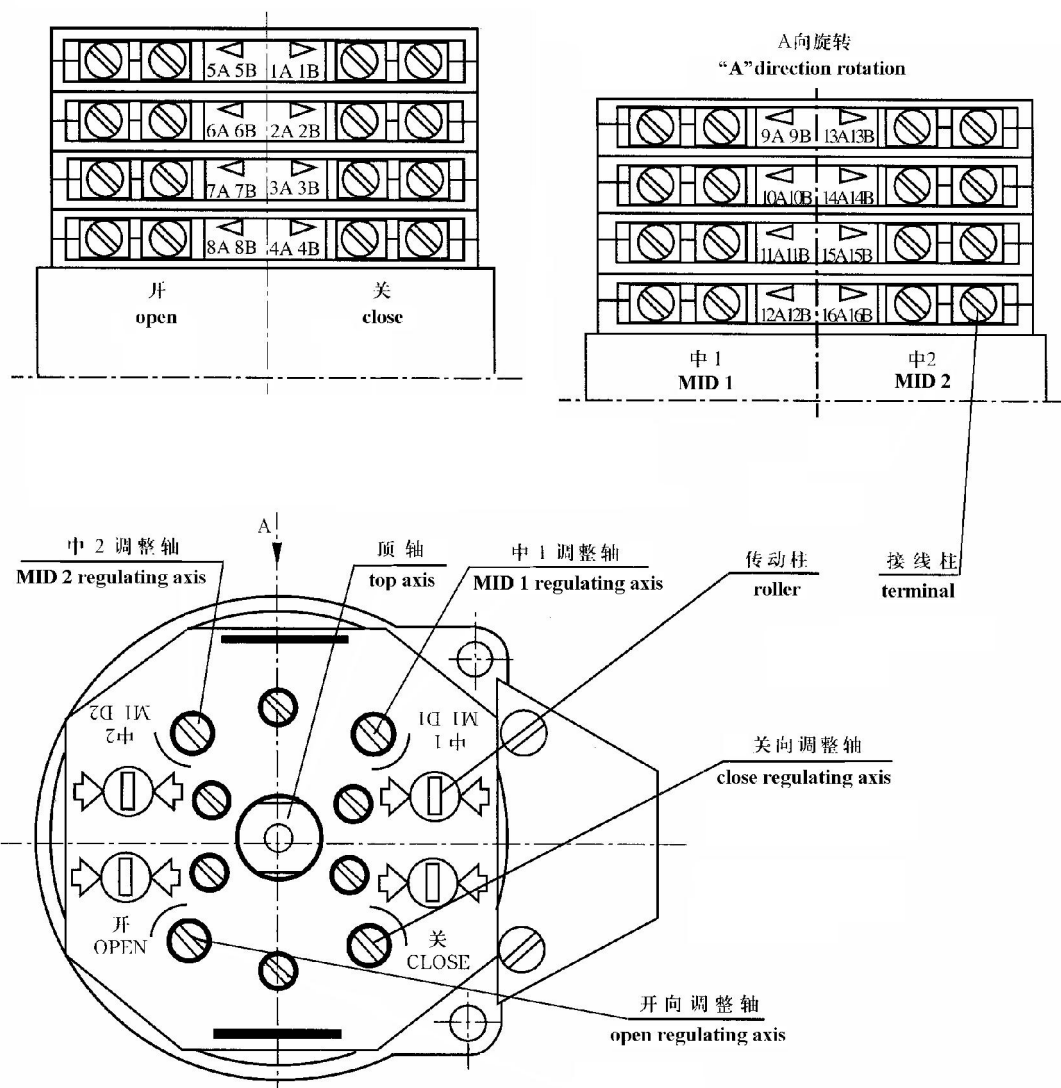


图 17 行程控制机构 Fig.17 Travel limit

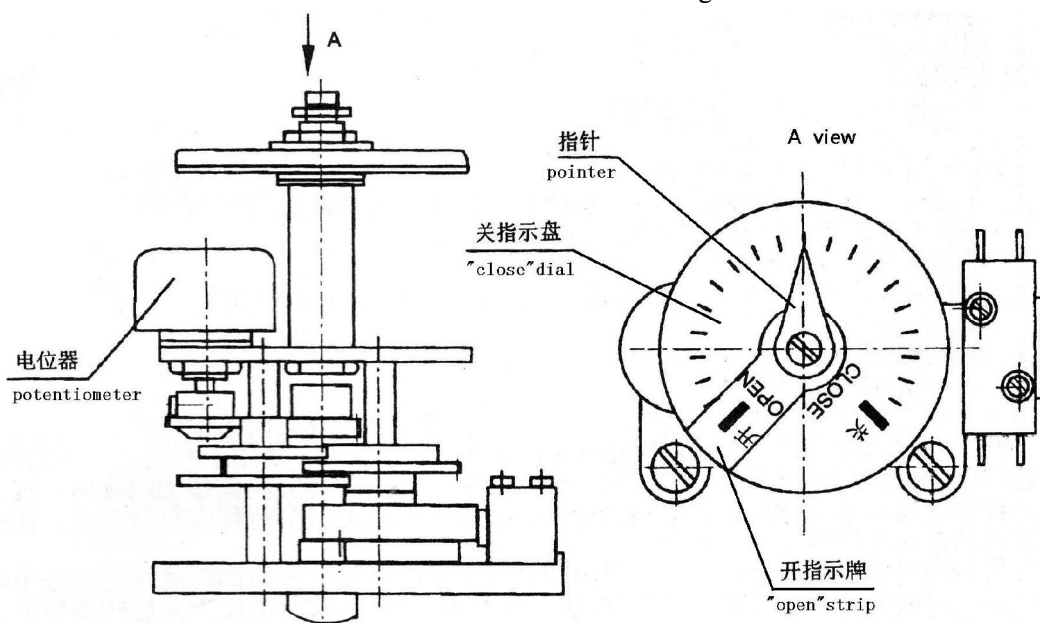


图 18 开度机构 Fig. 18 Valve position indicator

3. 开度机构的调整 开度机构结构见图 18，调整方法如下

- (1) 电动或手动操作，将阀门关至“全关”位置后，切断电源。
- (2) 松开开度指示盘上的指针螺钉，使指针与刻度盘上的“关”对齐，再将螺钉拧紧。
- (3) 用钳子夹住电位器转轴，面对指示盘，按指针关方向转动电位器转轴至接近终端位置。
- (4) 电动或手动将阀门“全开”，保持“关”指示盘不动，转动“开”指示盘至指针所在的位置。
- (5) 电动检查闪光。红灯在阀门开启过程中发出闪光，阀门全开时红灯亮。绿灯在阀门关闭过程中闪光，阀门全关时绿灯亮。（见电气原理图）

8.3 Adjustment of Valve Position Indicator

The structure of Valve Position Indicator refers to Figure 18.

8.3.1 Operate the valve to “full closing” by hand operating or electrical operating and the cut off the power supply.

8.3.2 Loosen screw of pointer on the position dial to make the pointer aim at “closing” on the dial and then tighten the screw once again.

8.3.3 Clamp the turning axis of potentiometer by pliers, and turn the axis confronting with the dial and along with the closing direction of the pointer to approach end position.

8.3.4 Operate the valve by hand operating or electrical operating to “full open”, keep the “closing” dial fixedly and turn the “opening” dial to where the pointer positioned.

8.3.5 Electrically operating the valve to check the flashing lamp. The red lamp will be flashing during the valve operates opening and will light steadily when the valve is full open. The green lamp will be flashing during the valve operate closing and will light steadily when the valve is full closed (Refer to electrical schematic diagram and wiring diagram).

4. 阀位变送器 BS-1 的调整（特殊供货）

BS-1 阀位变送器其取样电位器选用高精度导电塑料电位器（独立线性度 $<1\%$ ，寿命 10×10^6 次）。安装位置为取代原电位器 RP1（见图 18）。图 19 中 22、23 为接线端子号，也是电流输出端，H 为指示灯，其亮度随输出电流的增大而变亮。调整方法如下：（以输出轴顺时针转动为关阀为例）使阀门处于全关位置，关方向旋转取样电位器转轴，使输出电流从大到小接近 4mA，（导电塑料电位器无限位）调节 T1 微型电位器，直至输出电流精确为 4mA；打开阀门至全开位置，调节 T2，直至输出电流精确为 20mA。如果输出轴逆时针转动为关阀，则取样电位器的调节旋向应相反。

BS-1 阀位变送器的工作电源直流 24V 通常由执行机构内部提供，24V 负与 23 号端子（电流输出端的负）共线。如果 24V 由外部提供，其接线方法见图 4 内部接线图。

8.4 Adjustment of BS-1 Transmitter (for special order)

Sampling potentiometer of BS-1 Transmitter of valve position signal is a conductive plastic potentiometer with high precision (absolute linearity $<1\%$ and lifetime 10×10^6 cycles).

Its installation position is the original sampling potentiometer RP1(refer to Figure 18). 22 and 23 in the fig. are terminal codes and output ends of current. H is indicating lamp. Its brightness increases along with the output current increases. The adjustment is as following (take clockwise rotation of output shaft for valve closing as example): Operate the valve to “full closing” position, turn the axis of potentiometer in valve closing direction till the output current varies from great to small and approaches 4 mA (conductive plastic potentiometer is without range limit), and adjust micro potentiometer T1 till output current is exactly 4 mA; operate the valve to “full open” position, and adjust micro potentiometer T2 till output current is exactly 20 mA. If counterclockwise rotation of output shaft for valve closing, the adjusting direction of sampling potentiometer will be reverse.

Operational power supply of BS-1 Transmitter D.C. 24 V is generally supplied by the actuator internally. Negative pole of 24 V and Terminal 23 (negative end of output current) is one and the same wire. If D.C. 24 V is supplied externally, the wiring refers to Figure 4 Internal wiring diagram.

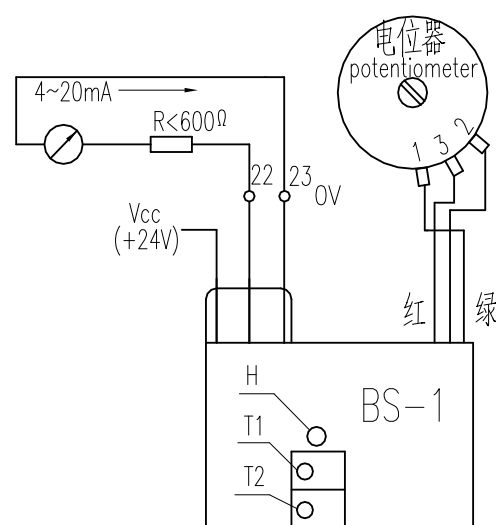


图 19 阀位变送器 Fig. 19 BS-1 Transmitter

5. 机械限位的调整

机械限位能起保护和精确定位作用。出厂时已调好（通常以全行程 90° 为标准）。启闭位置可在 $\pm 5^\circ$ 内调整。参见机械限位示意图，拧下盖形螺母，能见到调整螺杆，旋进或旋出调整螺杆，即改变了阀门定位和回转角度。当全行程为 90° 时，调整螺杆伸出箱体的长度 L 如下：基本型为 24，叠 1 号减速器为 30，叠 2 号减速器为 28。

8.5 Adjustment of mechanical limit

The mechanical limit has the function of protection and precise positioning and has been set before delivery (Whole travel of standard model is generally 90 degrees). Opening and closing position can be adjusted within $\pm 5^\circ$. Refer to schematic drawing of mechanical limit and screw off Cap Nut and then Adjusting Screw is revealed. Screw in or out Adjusting Screw to change the valve positioning and rotation degrees.

When whole travel is 90 degrees, Extrusion length out from housing L is as following: 24 mm for basic models, 30 mm for Combination 1 Reducer, and 28 mm for Combination 2 Reducer.

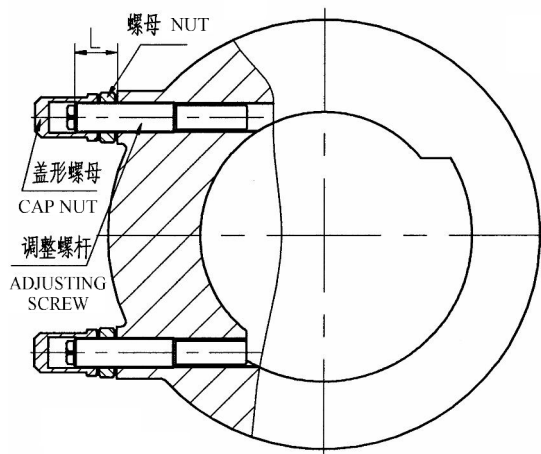


图 20 机械限位示意图

Fig.20 mechanical limit

九 故障及其排除方法 Troubles and Troubleshooting

序号	故 障	原 因	排 除 方 法
1	电动机不能启动	1. 电源不通 2. 操作回路不通 3. 行程或力矩控制器开关动作 4. 电源电压过低	1. 接通电源 2. 排除回路故障 3. 解除开关的动作状态 4. 检查电源
2	输出轴旋向与规定要求相反	电机电源相序不对	三相线中任意对调二相
3	电机过热 或有连续嗡嗡声	1. 连续试车时间过长 2. 电装与阀门选配不当 3. 电机二相运转	1. 停止试车，待电机冷却 2. 复核配套情况 3. 检查供电回路
4	运行中电机停转	1. 负载过大，力矩控制器动作 2. 阀门故障	1. 适当提高力矩控制器的设定值 2. 检查阀门
5	阀门到位电机不停转， 阀位指示灯不亮	1. 行程或力矩控制器失灵 2. 行程控制器调整不当 3. 外部电源开关或接触器故障	1. 检查行程及力矩控制器 2. 重新调整行程控制器 3. 检查排除
6	远方开度发信失控	1. 开度齿轮或电位器齿轮松动，电位器不转 2. 电位器损坏 3. 远传开度电路故障	1. 检查齿轮 2. 更换电位器 3. 检查电路
7	现场开度指针不动	1. 指针的紧固螺钉松动 2. 传递开度指示的齿轮组装配不当可松动	1. 拧紧紧固螺钉 2. 检查齿轮的传动情况

8	电机运行但阀门不动	1. 离合器损坏 2. 阀杆螺母严重磨损	1. 解体更换 2. 更换阀杆螺母
9	阀位变送器无输出或输出电流无变化	1. 无 DC 24V 工作电压 2. 取样电位器不转 3. BS-1 模块损坏	1. 检查 24V 电源 2. 检查开度齿轮和电位器 3. 更换

No.	Troubles	Cause	Troubleshooting
1	Motor does not run	1. Power supply is disconnected 2. Operating loop faults 3. Switch of travel or torque acts 4. Voltage is too low	1. Connect the power supply 2. Clear the loop fault 3. Eliminate the action status of switch 4. Check power supply
2	Output rotation is reverse	Power phase sequence is disordered	Any two lines of the phase exchange
3	Motor is overheated or hums continuously	1. Too long time a trial run 2. Actuator does not mate valve 3. Motor runs with phase loss	1. Stop trial run to cool motor 2. Check the matching 3. Check power supply circuit
4	Motor stops during running	1. Torque level acts due to overload 2. Valve faults	1. Increase set value of torque level properly 2. Check valve
5	Valve operates to set position, motor does not stop and valve position indicating lamp does not light	1. Travel or torque control faults 2. Improper setting of travel limit 3. Switches of external power or contacts fail	1. Inspect travel limit and torque level 2. Reset travel limit 3. Check and eliminate the failure
6	Remote position signal transmitting is out of control	1. Gear of indicator or potentiometer looses and potentiometer does not rotate 2. Potentiometer damaged 3. Transmitting circuit faults	1. Check the gear 2. Replace the potentiometer 3. Check the circuit
7	Local position indicating pointer does not rotate	1. Fix screw of pointer looses 2. Gear set driving position indicating is not assembled properly	1. Tighten the screw 2. Check the driving of gear
8	Motor runs but valve does not operate	1. Clutch damaged 2. Stem nut wears out seriously	1. Disassemble and replace the clutch 2. Replace stem nut
9	Transmitter provides no output or output current does not vary	1. DC 24V working voltage is not provided 2. Sampling potentiometer does not rotate 3. Module BS-1 damaged	1. Check 24V power supply 2. Check position indicating gear and potentiometer 3. Replace the module

厂 址：江苏省常州市武进高新技术产业开发区凤栖路 8 号
邮 编：213164
总 机 电 话：0519—88898989
销 售 处 电 话：0519—89856689 0519—89856698
销 售 处 传 真：0519—86643393
核电军品处电话：0519—89856696
核电军品处传真：0519—89856695
技 术 处 电 话：0519—89856681
技 术 处 传 真：0519—89856682
用户服务处电话：0519—89856692
用户服务处传真：0519—89856693
公 司 网 址：www.czcdf.cn
E - m a i l : yjs@czcdf.cn (技术)
xsc@czcdf.cn (销售)
厂 休：星期六、星期日

本产品设计如有更改，以实物为准，恕不另行通知。

2017.3